Space Weather Forecast

Issued on Monday 4 November 2024 at 00:57 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High solar activity with Moderate flares expected, and a slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity was moderate with four Moderate flares, the largest of which from a developing region in the southeast. There are thirteen active regions, including three as yet unnumbered regions. The spot mentioned above has become larger and more complex in recent hours and has been responsible for several moderate flares, with a region approaching centre disc also showing some complexity. Numerous spots are set to rotate off the western limb in coming days with several also rotating over the eastern limb which will have to be further analysed as they rotate further onto the disc. The other spots on the disc have remained fairly stable, or are showing signs of decline.

No Earth-directed CMEs (coronal mass ejections) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds have generally been at slightly elevated levels. The Interplanetary Magnetic Field (IMF), Bt, was moderate. The north-south component, Bz, was moderately positive (northward directed) until 03/1745UTC, from at which point it became weakly negative (southward directed). Geomagnetic activity was mainly Quiet to Unsettled (Kp0-3), but became active (Kp4) between 04/2100-2400

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained below S1 Minor Radiation Storm levels, continuing to slowly ease through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate or High activity is expected to continue with occasional Moderate flares expected and a chance of further isolated Strong flares.

Solar Wind / Geomagnetic Activity: A CME which left the sun during the 31st Nov has the potential to give a glancing blow to Earth early day 1 (04 Nov). Fast winds from two coronal holes may also cause some enhancement through Day1-2 (04-05 Nov). Generally Unsettled geomagnetic activity is expected initially, with a chance of Active and a slight chance of G1/Minor Geomagnetic Storm intervals given the combined risk of a glancing CME blow and HSS influence. Activity then expected to decline to quiet to unsettled levels by Day 3 (06 Nov) although confidence in this is lower than usual.

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Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is now below the S1 Moderate Radiation Storm level, and continuing to slowly decline. However, any further notable flares bring a persistent chance for further enhancement during the period.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	80	80	80	80
Very Active	R3-R5 (X Class)	No	20	20	20	20

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	25	25	20	20
Very Active	≥ S3 *	No	5	5	5	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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